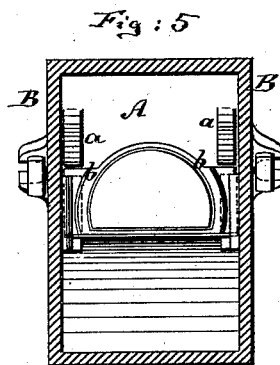
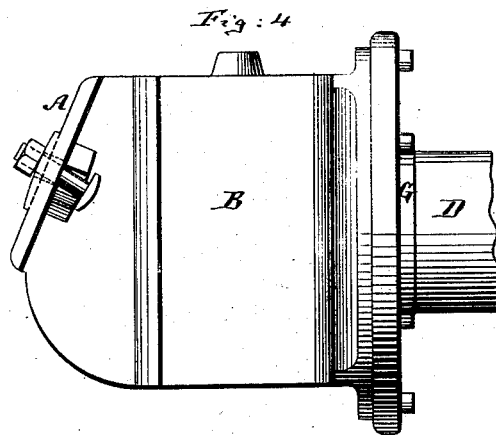
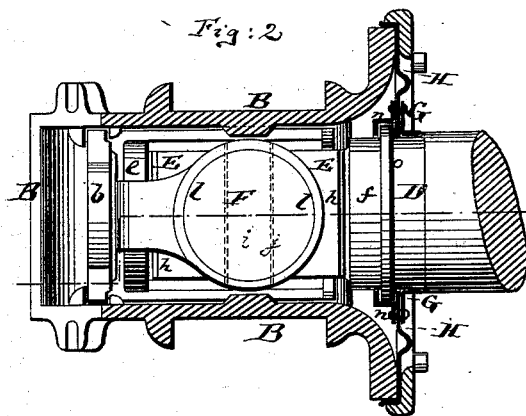
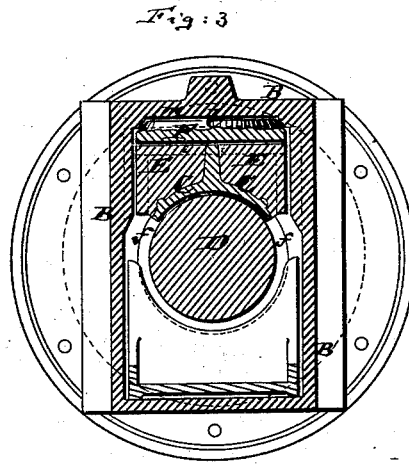
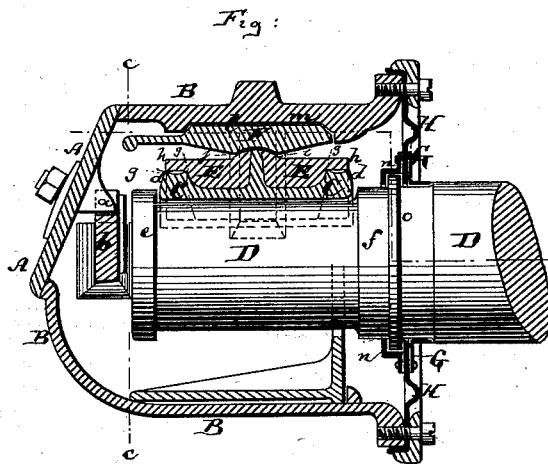


D. A. HOPKINS.  
Car-Axle Box.

No. 216,517.

Patented June 17, 1879.



Witnesses:  
John C. Tunbridge  
A. Briesen

Inventor:  
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A. Briesen

# UNITED STATES PATENT OFFICE.

DAVID A. HOPKINS, OF PARK RIDGE, NEW JERSEY.

## IMPROVEMENT IN CAR-AXLE BOXES.

Specification forming part of Letters Patent No. **216,517**, dated June 17, 1879; application filed April 21, 1877.

### *To all whom it may concern:*

Be it known that I, DAVID A. HOPKINS, of Park Ridge, in the county of Bergen and State of New Jersey, have invented new and useful Improvements in Car-Journal Boxes, of which the following is a specification.

The object of my said invention is, first, to prevent the destruction of the ends of the stop-bars used to restrict the end movements of car-journals and of the seats therefor in the journal box or housing caused by the jumping and pounding of said bars in said seats when in use; second, to secure a firm bearing of the top of the flanges at the ends of the anti-friction plate or wearing part of the journal-bearing upon the under side of the projecting ends of the iron part or back of said bearing, which overlie and are intended to bear upon said flanges without danger of breaking said projecting ends, and without the expense of reducing said flanges to the exact height of the spaces provided for them; third, to secure the automatic proper distribution along the journal of the weight placed upon the journal-bearing, and at the same time prevent the bending or breaking of the bearing in case of its being subjected to extreme heat while in use; fourth, to secure the perfect self-adjustment of the journal-bearing to the lateral direction of the journal without regard to errors in the relative lateral placement of the journal-box; fifth, the permanent closing of the wheel end of the journal-box against the admission of dust, and to prevent the escape of oil from the box by following along the axle when it is running.

Figure 1 represents a vertical longitudinal section of my improved journal-box. Fig. 2 is a horizontal section of the same. Fig. 3 is a central cross-section of the same; Fig. 4, a side view of the same; and Fig. 5 a cross-section thereof on the line *c c*, Fig. 1.

Similar letters of reference indicate corresponding parts in all the figures.

My said invention consists—

First, in so locating the lugs or spurs *a a* upon the inner side of the cap *A* of the box *B* that the closing and fastening of said cap in place causes said lugs to rest and be firmly drawn down upon the stop-bar *b* used for re-

stricting the end play of the axle, any space left between said bar and lugs resulting in jumping and pounding of said bar in the seats in the interior of the box in which the ends of said bar rest when in use, such jumping and pounding when permitted resulting in the speedy destruction of said seats and ends. By the use of these lugs I am enabled to bring the stop-bar entirely in front of the axle, and not above the same, so that it will not be in the way of the movable anti-friction plate *C*, or of the parts above the same, and also away from the cap *A* of the box, so that if it receives an end thrust it will not reach or force open the cap.

Second, in the grooving of the top of the flanges *d d* at the ends of the anti-friction plate *C*, or wearing part of the journal-bearing, which receive the wear of the collars *e f* of the journal *D*, so that only the thin edges *g g* of such flanges *d* come in contact with the overlying ledges *h h*, or projecting ends of the cast-iron part *E*, or back of the bearing, upon the under side of which said flanges should and are intended to bear, and which would often be broken by said flanges being somewhat too long, unless they were in each case reduced to the exact height of the space intended for them, or so made as to admit of being slightly crushed down by said ledges *h* without offering great resistance thereto.

Third, in the combination in a journal-bearing of the anti-friction plate *C*, for the wear of the journal *D*, with a cast-steel or cast-iron support or back, *E*, therefor, so made, in combination with the slide *F*, which is interposed between the bearing and box *B*, that the load placed upon the back of the bearing shall be received by it from the slide *F*, and carried upon a line running in a direction transversely across said back, at or near the center thereof, said back being made strong enough to safely carry the load placed upon it, as above, without aid from the anti-friction plate *C*, and said slide *F* and bearing-back *E* being made with a rounded transverse ridge, *i*, upon one of them, and a corresponding transverse groove, *j*, on the other, located at said load-receiving and carrying point, and with needed space between them elsewhere by leveling

the lower face of the plate F at each side of the groove *j*, substantially as in Figs. 1 and 2 of the accompanying drawings, by means of which ridge, groove, and space the bearing rocks freely, and is enabled to follow and constantly maintain its true adjustment to the journal D in its horizontal changes of position, as compared with the relative horizontal position of the box, without essentially changing the point on the back of the bearing at which the load is received and carried, as above. The flat back or top of the slide F is made with a partly or wholly circular boss, *l*, and the lower face of the box B with a corresponding recess, *m*, substantially as shown in the accompanying drawings, by which the tendency of the bearing to being thrown out of line with the journal by end thrusts received by it is obviated, and the slide is enabled to turn freely with the bearing, which is thus enabled to adjust itself easily and perfectly to the lateral direction of the journal.

Fourth, in the combination of the sleeve G, at the back of the box, with the axle D, substantially as shown in accompanying drawings, by which the sleeve is compelled to accompany the axle in its end movements. In this case the sleeve has an inner groove, *n*, into which enters a collar, *o*, on the axle, by which the axle is permitted to revolve freely in the groove and sleeve, while the sleeve is compelled to accompany the axle in its longitudinal or vibratory movements instead of said end movements being through the sleeve, which, when permitted, facilitates the escape of oil from and admission of dust into the box. Also, in the combination, with said sleeve G and box B, of a flexible diaphragm, H, secured to both and closing the space between them, and made so full and loose between them as to permit all ordinary movements of the axle and sleeve without said diaphragm being torn from its fastenings. A groove may be formed in the axle in place of the collar *o*, and a collar formed on the sleeve secured therein, by which the sleeve would be compelled to accompany the axle, the same as by the use of a collar, *o*, as shown.

The use of what is known as the "ball-and-socket bearing" in place of the transverse rib *i* and groove *j* is objectionable for use on car-journals, because of its allowing the bearing to roll sidewise, and thus throw one axle out of its parallel position relative to the other axle or axles used in the same truck. It is imperatively necessary that bearings receiving and carrying their load, as above, shall be made with a cast-iron or cast-steel back, or the equivalent thereof, having sufficient strength to carry the load placed upon it without aid from the anti-friction plate, and to sustain said plate and keep it in place in case of extreme heating, the strength of cast iron or steel used as above for load-carrying being but little, if at all, impaired at a heat at which bronze and

all other anti-friction alloys and metals entirely lose their load-carrying faculty, and if without the support of the cast iron or steel back cause the ruin of the journal.

The use of cast-iron simply as a back for journal-bearings is not claimed by me in this case as new, it having been very extensively used for that purpose under Letters Patent granted to me February 23, 1858, and March 11, 1862; the feature of novelty in this case being its use in a bearing made so as to receive, carry, and distribute its load as above, and by which the use of bearings so made is rendered practicable and safe.

The use of stop-bars for restricting the end movement of journals in their boxes is not claimed by me in this case as new, the new feature in relation thereto being the holding of them down firmly in place by locating the lugs on the cap-piece, as set forth, by which the destruction of the ends of the bar and of the seats receiving them is prevented, thus rendering the use of stop-bars practicable.

The only feature in this case relative to the construction of the anti-friction plate or part of the bearing claimed by me as new is the grooving or cutting away of a part of the top of the flanges at the ends of said plate, by which the fitting of said plate into the back is facilitated and cheapened.

The use of a slide between the bearing and the top of the box is not new, my invention relative thereto being the peculiar construction of the back of the slide and under side of the top of the box, by which the slide is enabled to turn freely with the bearing, so that the latter, when made and combined with the slide, as herein set forth, may, by the turning of the slide, as provided for, readily adjust itself to the lateral direction of the journal without regard to relative lateral errors in the position of the box.

Having thus fully set forth the nature of my said improvements, with their advantages and the means whereby they may be made useful to others, I claim as my invention and desire to secure by Letters Patent—

1. The combination of the inclined cap A of the journal-box with the lugs *a*, attached thereto, and with vertically-sliding stop-bar *b*, all arranged so that by tightening the inclined bolts which hold the cap in place the lugs will be caused to bear firmly upon the top of the stop-bar, substantially as herein shown and described.

2. The anti-friction plate C, constructed with flanges *d d*, which have thin edges *g*, and intervening grooves at their upper edges, substantially as shown and described.

3. The combination of the bearing-back E, having the transverse ridge *i*, with the circular plate F, having the transverse groove *j* between beveled lower faces, and with the top plate of the journal-box, having a circular recess for the reception of the flat top or

plate F, substantially as herein shown and described.

4. The combination, with the sleeve G, having inner groove, *n*, and with the axle, having collar *o*, which enters said groove, of the box B and of a flexible diaphragm, H, secured to the box and to the sleeve, and serving to close

the space between them during the positive motion of the sleeve, substantially as specified.

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Witnesses:

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